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Claims Listing

- 1. (Currently amended) An antenna structure comprising: 1 2 at least one antenna element, the at least one antenna element having at least one 3 4 taper; and 5 a symmetrical finite ground plane coupled with the at least one antenna element: 6 7 8 wherein the at least one antenna element comprises a traveling wave antenna 9 supporting a phase velocity greater than the speed of light.
- 1 2. (Canceled) The antenna structure of Claim 1, wherein the at least one antenna 2 element comprises a travelling wave antenna supporting a phase velocity greater than the 3 speed of light.
- Original) The antenna structure of Claim 1, wherein the taper comprises a linear
- 2 profile, a linear constant profile, a broken-linear profile, an exponential profile, an
- 3 exponential constant profile, a tangential profile, a step-constant profile, or a parabolic
- 4 profile.
- 1 4. (Original) The antenna structure of Claim 1, wherein the antenna structure
- 2 supports a cigar-like directional three-dimensional beam pattern and a butterfly wing-like
- 3 directional three-dimensional beam pattern.

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- 1 5. (Original) The antenna structure of Claim 1, wherein the at least one antenna
- 2 element is positioned at an angle from the symmetrical ground plane.
- 1 6. (Previously presented) The antenna structure of Claim 5, wherein the angle is
- 2 about 90 degrees with respect to the x-, y- and z- axes.
- 1 7. (Original) The antenna structure of Claim 1, wherein the at least one antenna
- 2 element is coupled with the symmetrical ground plane by means of an unbalanced
- 3 impedance.
- 1 8. (Original) The antenna structure of Claim 7, wherein the unbalanced impedance
- 2 comprises a coaxial cable.
- 1 9. (Original) The antenna structure of Claim 7, wherein a first conductor of the
- 2 unbalanced impedance mechanically couples the at least one antenna element with the
- 3 symmetrical ground plane.
- 1 10. (Original) The antenna structure of Claim 1, wherein the symmetrical ground
- 2 plane is disk shaped.
- 1 11. (Currently Amended) An antenna structure comprising:
- an array of at least two antenna elements, each antenna element having at least
- 4 one taper;

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6 a symmetrical finite ground plane; and

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an unbalanced impedance for coupling the array of at least two antenna elements with the symmetrical ground plane;

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11 wherein at least one antenna element of the array comprises a traveling wave antenna supporting a phase velocity greater than the speed of light,

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- 12. (Canceled) The antenna structure of Claim 11, wherein at least one antenna 1
- element of the array comprises a travelling wave antenna supporting a phase velocity 2
- 3 greater than the speed of light.
- 13. (Original) The antenna structure of Claim 11, wherein the taper of at least one 1
- 2 antenna element of the array comprises a linear profile, a linear constant profile, a broken-
- linear profile, an exponential profile, an exponential constant profile, a tangential profile, 3
- a step-constant profile, or a parabolic profile.
- (Original) The antenna structure of Claim 11, wherein each antenna element of the 1 14.
- array supports a cigar-like directional three-dimensional beam pattern and a butterfly 2
- 3 wing-like directional three-dimensional beam pattern.
- 15. (Original) The antenna structure of Claim 11, wherein each antenna element of the ì
- array is positioned at an angle from the symmetrical ground plane. 2

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- 1 16. (Previously presented) The antenna structure of Claim 15, wherein the angle for
- 2 each antenna element is about 90 degrees with respect to the x-, y- and z- axes.
- 1 17. (Original) The antenna structure of Claim 11, wherein the unbalanced impedance
- 2 comprises a coaxial cable.
- 1 18. (Original) The antenna structure of Claim 17, wherein a first conductor of the
- 2 unbalanced impedance mechanically couples each antenna element of the array with the
- 3 symmetrical ground plane.
- 1 19. (Original) The antenna structure of Claim 11, wherein the symmetrical ground
- 2 plane is disk shaped.
- 1 20. (Original) The antenna structure of Claim 11, further comprising a slow wave
- 2 antenna to widen the directivity of the antenna structure.
- 1 21. (Currently Amended) An apparatus comprising:
- 3 a transceiver; and

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- 5 an antenna structure for radiating or capturing electromagnetic energy from or to
- 6 the transceiver comprising:
- at least one antenna element having at least one taper, the taper comprising
- a linear profile, a linear constant profile, a broken-linear profile, an

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10	exponential profile, an exponential constant profile, a tangential profile, a
11	step-constant profile, or a parabolic profile;
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13	a symmetrical disk shaped finite ground plane, the at least one antenna
14	element being positioned at an angle from the symmetrical disk shaped
15	finite ground plane; and
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17	an unbalanced impedance for coupling the at least one antenna element
18	with the symmetrical disk shaped finite ground plane:
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20	wherein the at least one antenna element comprises a traveling wave
21	antenna supporting a phase velocity greater than the speed of light.

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- (Original) The apparatus of Claim 21, wherein the at least one antenna element 1 22.
- supports a cigar-like directional three-dimensional beam pattern and a butterfly wing-like 2
- 3 directional three-dimensional beam pattern.
- (Previously presented) The antenna structure of Claim 21, wherein the angle is **23**. 1
- about 90 degrees with respect to the x-, y- and z- axes. 2
- (Original) The antenna structure of Claim 21, wherein the unbalanced impedance 1 24.
- 2 comprises a coaxial cable.
- 1 **25**. (Original) The antenna structure of Claim 21, wherein a first conductor of the
- unbalanced impedance mechanically couples the at least one antenna element with the 2
- 3 symmetrical ground plane.